

CLAIMS

1. A vacuum generating device, particularly for operating actuator members in fluid delivery systems, which device comprises a duct (3) extending along a longitudinal axis (L) for the passage of a main pressurized fluid, said longitudinal duct (3) having an inlet portion (4), an outlet portion (5) and a restricted portion (6) located therebetween and adapted to generate a vacuum by Venturi effect, a first radial conduit (7) in fluid communication with said restricted portion (6) and with the outside, characterized in that it comprises at least one second radial conduit (9), in fluid communication with said restricted portion (6) and with the outside.

2. Device as claimed in claim 1, characterized in that said first radial conduit (7) has at least one connecting port (8) for transmitting said vacuum to one or more external actuator members (2) and said second radial conduit (9) has an orifice (10) for communication with the outside environment, which is designed to change the pressure in said first (7) and said second (9) radial duct and also the flow conditions in said outlet portion (5).

3. Device as claimed in claim 2, characterized in that it has a central chamber (20) to put said first and said second radial conduits (7, 9) in fluid communication with each other and with said restricted portion (6).

4. Device as claimed in claim 3, characterized in that said inlet portion (4) is formed within a main body (11), and said outlet portion (5) is formed within a tubular member (12).

5. Device as claimed in claim 4, characterized in that said inner diameter (D_R) of the restricted portion (6) is smaller than the inside diameters (D_I , D_U) of the inlet portion (4) and the outlet portion (5) respectively, said main body (11) and said tubular member (12) being connected with each other so that said inlet (4), outlet (5) and restricted (6) portions are aligned along said longitudinal axis (L).

6. Device as claimed in claim 5, characterized in that said central body (11) comprises a hollow seat (13) which is adapted to house a connecting portion (14) of said tubular member (12).

5 7. Device as claimed in claim 6, characterized in that said connecting portion (14) of said tubular member (12) has external threads (15) for engagement in corresponding internal threads (16) on said hollow housing (13) of said main body (11).

10 8. Device as claimed in claim 6, characterized in that it comprises a sealing ring (17) between said main body (11) and said tubular member (12), which is positioned at a peripheral edge (18) of said hollow seat (13).

15 9. Device as claimed in claim 4, characterized in that said first and said second radial conduits (7, 9) are formed within said main body (11).

20 10. Device as claimed in claim 9, characterized in that said first and said second radial conduits (7, 9) substantially extend along a common geometrical plane, which is orthogonal to said longitudinal axis (L).

25 11. Device as claimed in claim 10, characterized in that said first and said second radial conduits (7, 9) are disposed along a common transverse axis (T), on opposite sides of said longitudinal axis (L).

30 12. Device as claimed in claims 6 and 9, characterized in that a longitudinal end (19) of the connecting portion (14) is positioned at a relatively small axial distance from said restricted portion (6) to receive the main pressurized fluid therefrom.

35 13. Device as claimed in claim 12, characterized in that said central chamber (20) is an annular space between the longitudinal end (19) of the connecting portion (14) of said tubular member (12) and the bottom surface (21) of

said hollow seat (13) of said main body (11).

14. Device as claimed in claim 3, characterized in that it includes means for closing said orifice (10) of said second radial conduit (9), which are adapted to
5 change the size of the orifice (10) and/or to selectively close it off.

15. Device as claimed in claim 14, characterized in that said closing means include a valve that is electrically controlled by a control unit.

10 16. Device as claimed in claim 2, characterized in that it comprises attachment means (23) for securing a connecting line (22) to one or more actuator members (2), said attachment means (23) being positioned at said connecting port (8) of said first radial conduit (7).

15 17. Device as claimed in claim 1, characterized in that it comprises a plurality of radial conduits (7', 7'', ...) in fluid communication with said restricted portion (6) and with the outside, each radial conduit (7', 7'', ...) of said plurality being substantially like said first radial conduit (7) and angularly staggered with respect to it.

20

18. Device as claimed in claim 17, characterized in that each radial conduit (7', 7'', ...) of said plurality has at least one respective connecting port (8', 8'', ...) for transmitting said negative pressure to a plurality of external actuator members (2', 2'', ...), the pressure in each of said radial conduits (7', 7'', ...) being
25 controllable by a respective valve or appropriate adjustment means.

19. Device as claimed in claim 1, characterized in that said first (7) and/or said second (9) radial conduit have at least one respective suction port (8, 10) for the passage of one or more secondary fluids which are designed to be mixed with
30 the main fluid at said restricted portion (6).

20. An assembly for operating an irrigation system, comprising at least one

actuator member (2, 2', 2'',...) adapted to displace one or more movable elements of said system by predetermined movements, characterized in that it comprises a vacuum generating device (1) according to one or more claims 1 to 19 connected to said actuator member (2, 2', 2'', ...) by a respective connecting line (22, 22',
5 22'', ...).